

AMENDMENTS TO THE CLAIMS

1. (Original) A cerium based composite oxide comprising:

0.1 to 50 mol% of at least one metal selected from the group consisting of yttrium, scandium, and rare earth elements excluding cerium and promethium, in term of oxides, and

50 to 99.9 mol% of cerium in terms of oxides,

wherein said composite oxide is in a form of acicular primary particles having an average aspect ratio (length/width) of 1.05 to 10.0.

2. (Original) A cerium based composite oxide in a form of secondary particles consisting of aggregates of primary particles of claim 1, and having an average aspect ratio of 5.0 to 40.0.

3. (Currently amended) A cerium based composite oxide comprising primary particles ~~of claim 1~~ and secondary particles of claim 2, and having a BET specific surface area of 5 to 40 m²/g, an average particle size of 0.1 to 0.5 µm, and a particle size distribution expressed by a particle size distribution index represented by the formula (1) of not higher than 1.6:

Particle Size Distribution Index

$$= (D_{84} - D_{16}) / (2 \times D_{50}) \dots (1)$$

wherein D₁₆, D₅₀, and D₈₄ each stands for an accumulated particle size of top 16%, 50%, and 84% particles from the finest.

4. (Original) A method for preparing cerium based composite oxide of claim 3 comprising the steps of:

(A) adding alkali to a cerium salt—containing mixed solution containing 0.1 to 50 mol% salt of at least one metal selected from the group consisting of yttrium, scandium, and rare earth elements excluding cerium and promethium and 50 to 99.9 mol% cerium salt to obtain a precipitate slurry of cerium based composite salt,

(B) introducing 0.1 to 1.0 mol carbonate ions per 1 mol of rare earth elements in the precipitate slurry, and heat—treating said precipitate slurry under atmospheric pressure at 40 to 100 °C to prepare precipitate of carbonate ion—containing cerium based composite salt,

(C) calcining said precipitate at 600 to 1000 °C to obtain calcined powders, and

(D) grinding said calcined powders.

5. (Original) The method of claim 4, wherein a total concentration of said cerium salt and said salt of at least one metal selected from the group consisting of yttrium, scandium, and rare earth elements excluding cerium and promethium in said cerium salt—containing mixed solution in step (A) is 0.1 to 1.0 mol/L, and

wherein said alkali in step (A) is in a form of an aqueous solution at a concentration of 0.3 to 2.0 mol/L.

6. (Original) A green compact molded by pressing a composite oxide of claim 3.

7. (Currently amended) The green compact of ~~claim 7~~ claim 6, wherein said compact completes shrinkage by heating at a heating rate of 5 °C/min up to 1300 °C.

8. (Original) A sintered product of a green compact of claim 6, having a relative sintering density of not lower than 99 %, and an average grain size of primary grains in the sintered product of 0.8 to 3.0 pm.

9. (Currently amended) A method of producing a sintered product of ~~claim 8~~ a green compact of claim 6, said sintered product having a relative sintering density of not lower than 99 %, and an average grain size of primary grains in the sintered product of 0.8 to 3.0 μm , said method comprising the steps of:

(A) adding alkali to a cerium salt—containing mixed solution containing 0.1 to 50 mol% salt of at least one metal selected from the group consisting of yttrium, scandium, and rare earth elements excluding cerium and promethium and 50 to 99.9 mol% cerium salt to obtain a precipitate slurry of cerium based composite salt,

(B) introducing 0.1 to 1.0 mol carbonate ions per 1 mol of rare earth elements in the precipitate slurry, and heat—treating said precipitate slurry under atmospheric pressure at 40 to 100 $^{\circ}\text{C}$ to prepare precipitate of carbonate ion—containing cerium based composite salt,

(C) calcining said precipitate at 600 to 1000 $^{\circ}\text{C}$ to obtain calcined powders,

(D) grinding said calcined powders to obtain composite oxide

(E) molding said composite oxide by pressing to prepare a green compact, and

(F) sintering a said green compact ~~of claim 6~~ at 1150 to 1400 $^{\circ}\text{C}$.